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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,065	05/29/2007	Toru Takahashi	SHIGA7.050APC	3534

20995 7590 04/03/2009  
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EXAMINER
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HAMILTON, CYNTHIA

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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04/03/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/580,065	<b>Applicant(s)</b> TAKAHASHI ET AL.	
	<b>Examiner</b> Cynthia Hamilton	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 2/22/06, 5/29/07, 6/18/08.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-10 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/22/2006, 05/29/2007, 06/18/2008</u> .                      | 6) <input type="checkbox"/> Other: _____                          |



### DETAILED ACTION

1. The information disclosure statement filed 29 May 2007 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. The foreign patent documents not supplied were crossed out. Applicants filed translations or abstracts for these documents but did not cite them with relevant information under Non Patent literature.

2. The information disclosure statement filed on 29 May 2007 does not fully comply with the requirements of 37 CFR 1.98(b) because: Reasons given above. Since the submission appears to be *bona fide*, applicant is given **ONE (1) MONTH** from the date of this notice to supply the above mentioned omissions or corrections in the information disclosure statement. NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) OR (b). Failure to timely comply with this notice will result in the above mentioned information disclosure statement being placed in the application file with the noncomplying information **not** being considered. See 37 CFR 1.97(i).

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 3-4 and 7-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 is as follows:

A chemically amplified positive photosensitive thermosetting resin composition comprising a reaction product of (A) an alkali soluble resin and (C) a crosslinking

Art Unit: 1795

polyvinyl ether compound, (B) a compound generating an acid under irradiation with radiation, and (D) an epoxy resin.

It is not clear in view of the specification, that the claim language means the reaction product of (A) + (B)+(C)+(D) as written. The examiner notes that while no “and” is before the (B) this is the tacit meaning of the comma. In the specification at the top of page 38 is found the following:

The composition of this embodiment is preferably in the form of liquid (solution or dispersion) which is prepared by dissolving or dispersing a reaction product of the components (A) and (C), the component (B), the component (D) and optional components, which may be optionally added, in an organic solvent. When the component (D) is slightly soluble, a dispersion is obtained.

At the bottom of page 40 is found reference to only components (A) and (C) being not reacted in the second embodiment. (A-2) Resin on page 53-54 does not appear to be the reaction product of (A) + (B)+(C)+(D).

Because there is confusion over what the applicant is claiming with respect to the reaction product and the composition in claims 1, 3-4 and 7-10, the claim language is held indefinite.

The examiner notes that the final cured imaged product as might be part of claims 1 and 10 is the reaction product of (A) + (B)+(C)+(D).

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1795

6. Claims 1, 3-4 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa et al (US 2002/0102401 A1) in view of Kondo et al (EP 0 609 684 A1) and Kondo et al (EP 0 702 271 A1). The examiner has in consideration of Ichikawa et al that a vinyl ether compound is not part of the composition but a reaction product of an unsaturated acid and a vinyl ether is part of the composition. This compound is polymerized through the acrylate forming a non crosslinked polymer via free radical initiation which forms an acid degradable resin with acid cleavable units but not crosslinked polymers. The addition of polyvinyl ethers would not yield the same linear polymer set forth in Ichikawa et al . Thus, the compositions of Ichikawa et al do not read on the instant invention of claim 2 at all as there is no vinyl ether present in their compositions US 2002/102501. With respect to the instant claim 1, the reaction product of the polymerized acrylate compound formed from vinyl ether and acrylic acid could be considered to be similar to the instant reaction product except again there is no crosslinked polymer present. However, with respect to instant compositions of 1, 3-4 and 7-10, the examiner believes the use of polyvinyl ethers would have been prima facie obvious to make the acrylated monomeric units which would be polymerized thus having in the free radically cured stage of the invention of US 2002/102501 a composition which makes obvious the instant composition and the element formed therefrom when considering the teachings of Kondo et al (EP 0 609 684 A1) and Kondo et al (EP 0 702 271 A1) where positive chemically amplified positive photosensitive compositions comprising a compound having at least two enol ether groups yields a composition with high development latitude in comparison to a composition having been made of vinyl ether. In EP 0 702 271 A1 see particularly page, 3, lines 20-56 and in EP 0 609 684 A1, see particularly page 2, lines 48-54 and page 3, lines 18 to 53.

Art Unit: 1795

7. Claims 1, 3-4 and 8/7/1, 3-4 through 10/9/1,3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakashima et al (US 6, 309,796 B1). With respect to instant claims 1, 3-4 and 8-10, Nakashima et al makes obvious the instant compositions, methods and objects formed but makes use of the same compositions to form negative images. Applicants in their method of claim 9 do not require a particular resist pattern be formed, only that a resist pattern be formed. Nakashima et al discloses a silicone resin with crosslinking groups made from reacting carboxylic acid and divinyl ether compounds and in the second aspect of their invention starting in column 41, lines 12-23, set forth a preferred chemically amplified negative resist composition comprised of

A preferred chemically amplified negative resist composition comprises

- (A) an organic solvent, 15
- (B) a base resin in the form of the above-defined silicone polymer, especially the silicone polymer in which some of the hydrogen atoms of carboxyl group or carboxyl and hydroxyl groups may be replaced by acid labile groups, 20
- (C) an photoacid generator, and
- (D) a crosslinkable compound by the action of acid.

. The

base resin set forth by Nakashima et al is inclusive of the crosslinked silicone resin made from divinyl ether and carboxylic acid groups on the silicone resin, and the crosslinkable compound is inclusive of the diepoxy resin set forth in lines 11-15 in col. 63. Thus, because the compositions of Nakashima et al make prima facie obvious the instant compositions although used for another purpose, i.e. to be used in negative imaging processes, the instant compositions methods and

Art Unit: 1795

objects made of applicant's claims 1, 3-4 and 8/7/1, 3-4 through 10/9/1, 3-4 are made obvious by Nakashima et al to form finely defined patterns having walls perpendicular the substrate for microfabriation and to form resist compositions which are highly transmissive to light of a short wavelength of 220 nm or shorter. In Nakashima et al, see particularly the ABSTRACT, Summary of the Invention, Column 4, lines 26- column 5, lines 28, col. 6, lines 9- column 7, lines 3, column 12, lines 19 to col. 40, lines 58, column 53, lines 29- column 93=94 and No. 63-64 for presence of amines. The compositions are essentially the same as that set forth by applicants thus if used in the intended manner set forth by the use of "positive" in the composition claimed would have yield the positive images desired, however, the intended use does not act to limit the obviousness of the actual composition, method or object formed unless the method indicates where the positive image is formed or the composition set forth would not be able due to its chemical nature be able to act in the intended way.

8. Claims 2, 5 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meier et al (4,994,346). With respect to instant claims 2, 5 and 9-10, Meier et al teaches the instant compositions with the exception of setting forth an explicit working example wherein both a polyfunctional epoxy resin and a polyfunctional vinyl ether compound is present with the solid film forming polyphenol and the cationic photoinitiator and with the exception of using them for a different intended purpose, i.e. negative photoresist imaging. However, the choice of one from three members set forth by Meier of the Markush group consisting of polyfunctional epoxy resin, polyfunctional vinyl ether compound and mixtures thereof would have been prima facie obvious in view of only three selections being present thus make obvious the instant



Art Unit: 1795

compositions, methods and cured products of instant claims 2, 5 and 9-10. The cationic initiator is inclusive of acid generators as shown in col. 9-column 11, lines 23.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Meier et al (5,124,233) teach the idea of a positive photoresist being imaged then hardened by curing of an epoxy resin. but there is no disclosure to chemically amplified reactions with respect to the imaging step present. Meier et al makes use of the aqueous base soluble binder and acid generation to form the developable image.

10. Claims 2, 5 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knudsen et al (5,262,280). Knudsen et al teaches compositions comprised of phenolic resin binders and epoxidized polybutadiene and divinylether and photoacid generators. Divinylethers are possible crosslinkers . There is no explicit example with these components present. In Knudsen et al , see particularly column 2, lines 38-column 5, lines 61, col. 9, lines 54-59, column 11, lines 18-30, column 14, lines 17-column 15, lines 68. With respect to instant claims 2, 5 and 9-10, the use of the divinyl ethers as crosslinkers in the compositions of Knudsen et al would have been prima facie obvious as the simple substitution of one known element for another to obtain predictable results in the methods set forth by Knudsen et al to form negative resist patterns in to objects with substantial flexibility.

11. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 1795

*Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Hamilton whose telephone number is 571-272-1331.*

*The examiner can normally be reached on Monday through Friday 8:30 am to 5:00 pm.*

*If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on (571) 272-0729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.*

*Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.*

/Cynthia Hamilton/  
Primary Examiner, Art Unit 1795

March 29, 2009